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ABSTRACT

This study presents a means of identifying economically efficient school districts in Illinois and provides an analysis of select school variables: school population; salary expenditure; level of teacher preparedness; number of years of teaching experience; and select ratios incorporating pupils, administrators, teachers, test scores, and percent low income. Economically efficient schools are identified as schools attaining higher than expected test scores at lower than expected costs. Expectation is based on the school districts' socioeconomic status and property wealth. The school variables are basically ethnic. Ethnic measures include counts of teachers and faculty. Except for salaries and class size, the variables used in this study are beyond the envelope of control exercised by the various boards and superintendents. Results based on chi-square analysis are given for four types of districts: technically efficient (17.9 percent), low service (18.1 percent), high service (14.8 percent), and technically inefficient (13.1 percent). Economically efficient schools may not turn out to be professionally effective schools. Other study limitations and further research directions are discussed. Suggested readings include books, monographs, legal citations, unpublished materials, and government publications. Several tables of variables and quadrants used in the study are presented. (MLH)

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Illinois State University
Center for the Study of Educational Finance

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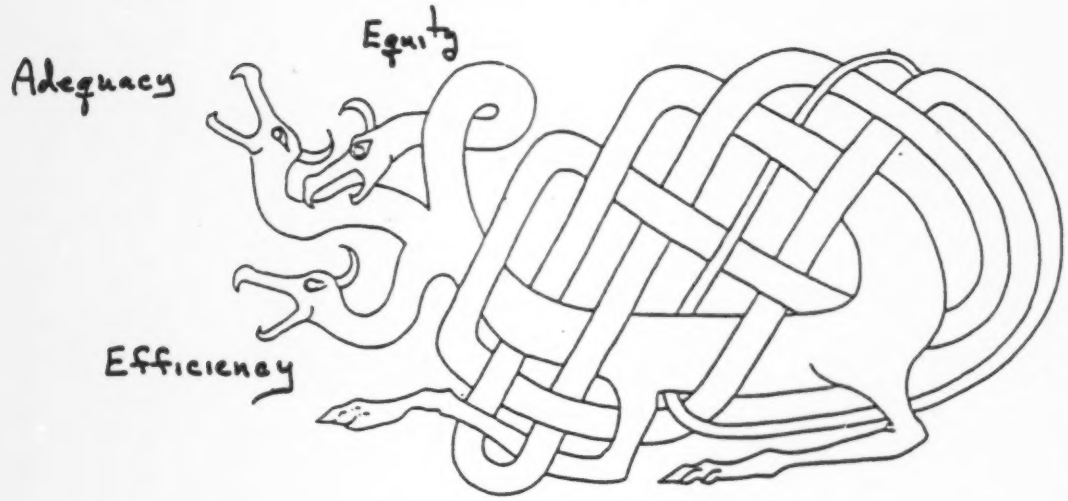
Peoria School District 150

A FURTHER APPLICATION OF THE QUADRIFORM TO THE STUDY OF ECONOMIC EFFICIENCY IN K-12 SCHOOLS IN ILLINOIS



School Finance

EA 023 609

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ABSTRACT

This study presents a means of identifying economically-efficient school districts in Illinois and provides an analysis of select school variables. School population variables, salary expenditure variables, level of teacher preparedness, number of years of teaching experience and select ratios incorporating pupils, administrators, teachers, test scores and percent low income were those considered here. Economically-efficient schools are identified as schools which attain higher than expected test scores at lower than expected costs. Expectation is based upon the socioeconomic status of the school districts and the property wealth of the school districts.

The school population variables are basically ethnic in nature. Ethnic measures include counts of teachers and faculty. With the exception of the salaries and class size, it is felt the all variables incorporated in the study are beyond the envelope of control exercised by the various boards and superintendents.

Specifically, the variables investigated were teacher/pupil ratio, administrator/pupil ratio, administrator/teacher ratio, percent of teachers in the districts by race, asian, black, hispanic, native american, white, average district student population by race, asian, black, hispanic, native American, caucasian. Average number of years teaching, average number of teachers with a bachelors degree, average number of teachers possessing a masters degree plus, average teacher salary and the total number of teachers in the district were the teacher centered variables. Administrator salaries were also used as were the average ACT composite, average high school class size and district graduation rate.

1.00.00 Introduction

The purpose of this study was the further explication of a new approach to the study of economic efficiency in the K-12 schools in the United States. The procedures outlined here further applies an investigative technique which was first reported in monograph number eleven, and further refined in monograph number sixteen of the MacArthur/Spencer special series on Illinois school finance as presented by the Center for the Study of Educational Finance at Illinois State University. Each of these documents report the findings of particular doctoral dissertations completed at Illinois State University in addition to several scholarly works contributed by particular scholars in the field of school finance and law.

This study attempts to identify Technically Efficient districts and then investigate characteristics of those

districts. Perhaps we will then be able to learn how or what constitutes an efficient district.

2.00.00 *Limitations to Existing Approaches to Economic Efficiency*

At this juncture there seems to exist at least three methodologies which could be applied to the study of economic efficiency in the public schools. The three methods could be grouped under the following three headings: "production functions," "cost effectiveness" studies, and "cost-benefit" studies. There exists a sizeable amount of literature concerning these topics. In the cause of brevity, the author suggests that anyone wishing to delve further should explore the suggested readings section at the end of the presentation.

3.00.00 *The Concept of a Quadriform*

The quadriform, in and of itself is nothing more than a tool devised so that an abstract situation can be portrayed in a somewhat understandable way. In the using the quadriform two related sets of data, pertinent to the cases in question, are employed in locating a particular case in relation to the other cases being investigated.

The concept of the quadriform begins with the same structural equations used in other econometric studies of school finance. Both cost and short-form production functions are used.

Figure 1 shows the interesting design that emerges when the residuals from the two equations are paired. It looks very much like an ancient heraldic shield with a so-called "first charge" (a cross) upon it. In the upper left hand corner are found districts with the desired higher than expected test scores, and lower than expected costs. These are considered to be economically-efficient. In the upper right hand corner are districts with both higher than expected test scores and higher than expected costs. Since it cannot be assumed that all output has been captured by the test scores, these districts are designated as "high service level districts." In the lower left quadrant are the lower than expected test score districts and the lower than expected cost districts. By the same assumptions, these are designated as "low service level districts." The districts in the lower left part of the design are frugal districts, but they are not very productive districts--not at least as they have been measured by productivity (from state wide standardized test scores). Finally, in the lower right hand corner of the design, in an area of the shield that ancient heraldry would have called the "sinister base" (sometimes history does come to the aid of the quantitative researchers), there are districts that have lower than expected test scores and also

higher than expected costs. These districts are termed economically inefficient, if the empirical definitions are accepted.

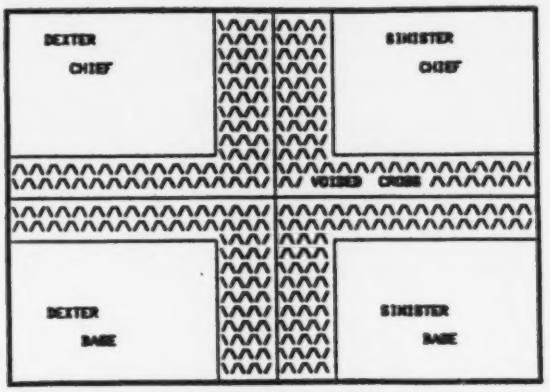
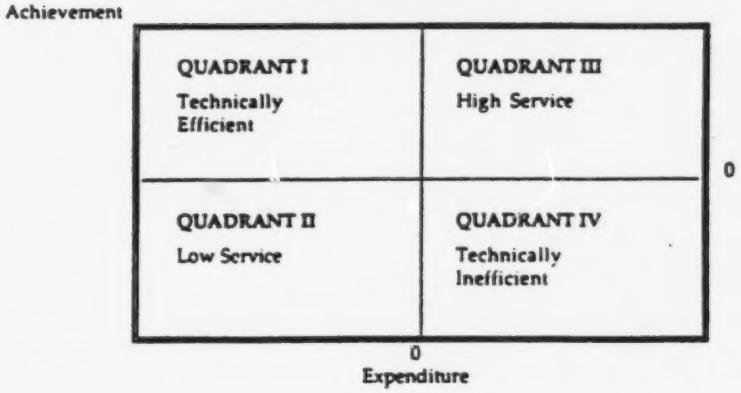


Figure 1. Heraldic Representation, Educational Finance Quadriform



Horizontal Axis:	Standardized Deviation from the Expected District Operating Expenditure per Pupil
Vertical Axis:	Standardized Deviation from the Composite ACT Score
Quadrant I	Lower than expected Average Expenditure per Pupil Higher than expected Average ACT Composite Score
Quadrant II	Lower than expected Average Expenditure per Pupil Lower than expected Average ACT Composite Score
Quadrant III	Higher than expected average Expenditure per Pupil Higher than expected Average ACT Composite Score
Quadrant IV	Higher than expected Average Expenditure per Pupil Lower than expected Average ACT Composite Score

Figure 2. Quadriform of Educational Production

The regression equaltions arrived at are as follows:

ACT Composite

$$Y = 23.23 - .004x_1 - .0002x_2 + .001x_3 + .01x_4 - .0005x_5 - .06x_6 + .03x_7 - .03x_8$$

	Beta
x_1 = Average Percent of all in District taking test	.028292
x_2 = Average Number of test takers in whole District	-.061578
x_3 = Average Percent of District in Vocational Education	.009237
x_4 = Average Percent Mobility in the District	.037343
x_5 = Average Percent Low Income Squared	-.323749
x_6 = Average Percent District Attendance	-.035932
x_7 = Average Percent of District's high school in college prep	.243511
x_8 = Average Percent Low Income Enrollment in District	-.214597

$R^2 = 0.41981$ F = 37.08265 SIGNIF F = .0000

District Operating Expenditure Per Pupil

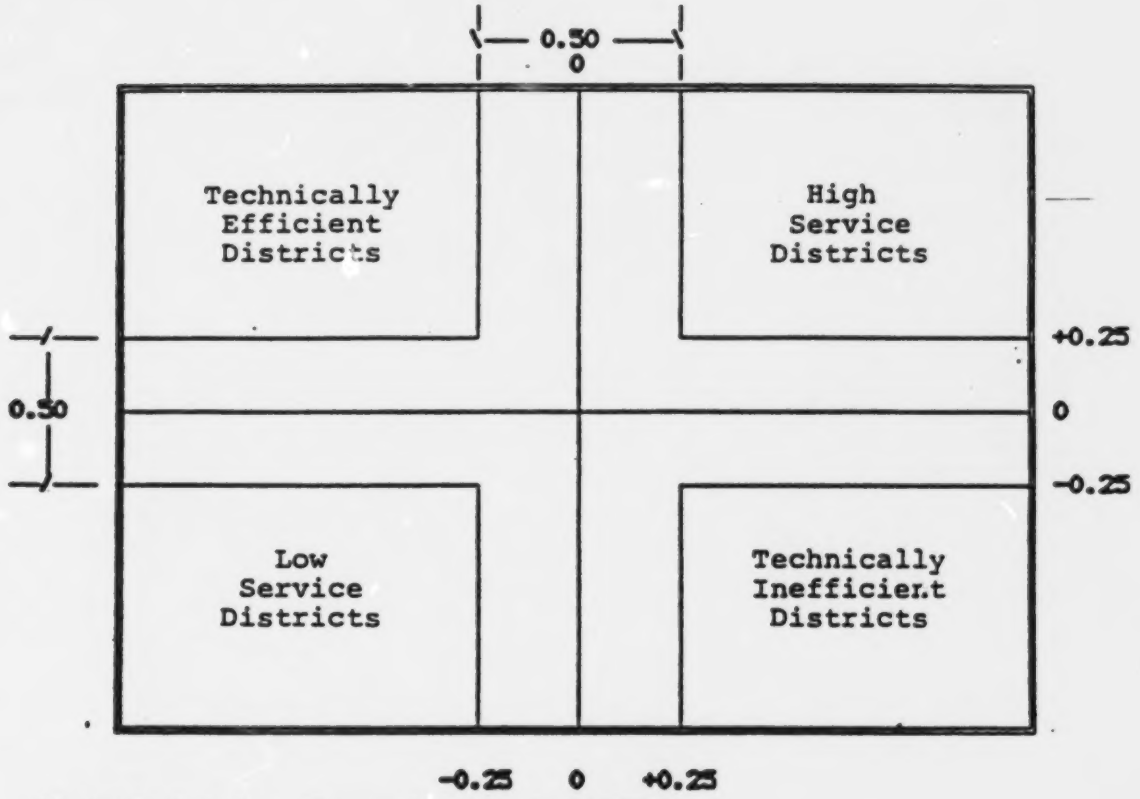
$$Y = 2408.68 - .0002x_1 + 19.80x_2 + .011x_3$$

	Beta
x_1 = Average Interaction between Low Income and Equalized Assessed Value	-.329169
x_2 = Average Percent Low Income	.507441
x_3 = Average Equalized Assessed Value per Pupil	.898261

$R^2 = 0.42952$ F = 104.15184 SIGNIF F = .0000

Figure 3. Regression Equations

Quadrant	Standardized Average ACT Composite Residual	Standardized Average Operating Expenditure Residual
1	GT + 0.250	LT – 0.250
2	LT – 0.250	LT – 0.250
3	GT + 0.250	GT + 0.250
4	LT – 0.250	GT + 0.250



Horizontal Axis: Regression Line for DOEPP
Vertical Axis: Regression Line for ACT Composite

Maximum Average DOEPP = 6761.75 Std Dev = 470.27 Mean = 3197.35
Minimum Average DOEPP = 1217.75

Maximum Avg ACT Composite = 22.00 Std Dev = 1.405 Mean = 18.778
Minimum Avg ACT Composite = 9.02

Figure 4. Educational Finance Quadriform Numeric Values

But, what about the "first charge," the cross in the design? Technically, heraldry would hold that area to be a "voided" cross since it is empty of information. Again, that is an appropriate term, since it is the area of the design that is established by the error of estimate in the two structural equations that is established by the error of estimate in the two structural equations that created the residuals. This much of the space is considered to be filled with error variance or "noise." This cross can be large or small depending on whether a full standard error of estimate is selected or whether a part of a standard error of estimate is selected. After some ad hoc experimentation, one-half of a standard error of estimate was selected as being sufficient to guard against random error in the residuals. That is arbitrary, but there is a second procedure which, hopefully, will also help to rule out random error or "noise" in the residuals.

It is assumed that there will be a great deal of random error in these residuals from year-to-year. The unit district in question might possibly remain at a particular position relative to other districts and the regression equations might possibly change. The change in the regression line would then give a misleading idea that the district is now located in a different quadrant when, in actuality, its position relative to other districts really should not have changed. Therefore, a four-year average of each individual variable used was calculated. The resulting average values were used in the computation of the desired statistics. In so doing, <u>all</u> unit districts in the state would be included in the study; the sample becomes the entire population.

The great advantage of the quadriform is that it forces one to make a conscious and deliberate distinction between "professional effectiveness" and "economic efficiency." This is its principal strength, and, from the point of view of many professional educators, it is very probably its principal weakness as well, as will be detailed below. In a sense, any public school with an average test score greater than expected, based on factors not under the immediate control of the administration of the district--these are usually socioeconomic characteristics of the district--could be considered an "effective" school. Such school districts are simply doing better than any one has any right to expect them to do, given the socioeconomic characteristics of their students. But, these may be "effective" schools at costs which are not acceptable to the majority of the taxpayers. They may be acceptable to professional educators, but to no one else.

The quadriform separates "effective" schools, so defined, into two groups: (a) districts that are effective at higher than expected costs, and (b) districts that are effective at lower than expected costs. That is to say, the quadriform enforces the

ancient Scottish virtue of frugality upon the design. The schools in the desired quadrant are not only "effective," but also, they are spending less than they really could actually spend, given the wealth of the district as measured in terms of property valuation per pupil. So, a basic theoretical and normative position has been established by the quadriform: to be "effective" in the public schools is a necessary, but it is not automatically also a sufficient condition. The charge given to public school administrators is certainly to be professionally effective, but that charge includes being effective at an acceptable cost.

Efficiency thinking need not always be carried out in terms of costs or dollars spent. Physicians think in terms of benefit/risk ratios all the time. Is the benefit of a surgical procedure worth the risk to the patient? The surgery may be expensive; it can go wrong; the surgery can require additional supportive medical work, etc. For that matter, is the benefit of a simple diet worth the hassle to stay on it for long periods of time? Unless the benefit is in terms of demonstrably increased health--and not in terms of merely cosmetics--the answer may be, "NO"--at least beyond a certain age where looks are less valued than at some prior point in life. There are also much more serious questions of an efficiency nature. Historically, the physician is dedicated to the continuation of life; but, if the quality of life of a patient degenerates beyond a certain level, it is difficult--perhaps it is impossible--to justify sustaining such an existence.

Educators in special education have faced those kinds of very difficult questions for generations. Is the amount spent on special education worth the benefits to the individual and to society? That last question is especially difficult. The calculation of individual benefit is difficult enough, but even more difficult is the estimate of whether or not the benefit to the larger society is sufficient to justify the expenditure. Often, the yield to the individual is sufficient to justify the expenditure from that individual's point-of-view, but what about the yield from the societal point-of-view? Efficiency thinking can bring one to a very ancient question of political economy, "Is it the greatest good for the greatest number for which we strive?" If that is so, then what about the good of any individuals who may have to be sacrificed in the process?

4.00.00 The Classification Results for Illinois Unit Districts

The findings and conclusions drawn in the present report are contingent on the definition of technical economic efficiency as presented by the quadriform. The study is in fact a replication of a doctoral dissertation completed at Illinois State University. The regression equations, the standard error of estimate are the same. What was changed with regards to this

study are the variables considered in the ANOVA and the various Chi Square analysis. The results of that dissertation was the topic of Monograph 16, The Biggest Band for the Buck: A Further Investigation of Economic Efficiency in the Public Schools of Illinois, published by the Center for the Study of Educational Finance at Illinois State University. A more thorough handling of the fundamental ideas concerning this study can be found in that work.

It must be remembered that the main intent here was to merely state a pair of serviceable functions in order to obtain needed residuals. That is to say, the test score equation and the expenditure equation are **NOT** the central focus; they are merely used to establish residuals which are, themselves, of greater interest than the predicted values.

When preparing the divisions for the crosstabs analysis it was decided to divide the ranges into stanine divisions. Having completed these divisions three segments were used to establish the upper third, middle third and the lower third. If no cases were reported for that division they were left to be blank for fear that further shrinkage would distort the results.

For those readers who are interested in detailed statistical results, the relevant data can be found in the following appendices:

- Appendix A contains the overall descriptives for all variables
- Appendix B contains a table of means for the variables tested by quadrant
- Appendix C contains the ANOVA tables of significant variables
- Appendix D contains the follow-up tests for significant variables between quadrants
- Appendix E contains a map of the counties of the state of Illinois. A listing of the number of school districts in each of the four quadrants is given in each county.

Prior to presenting the conclusions derived from the study it might be of interest to be presented with the break-down of the quadrants and the voided cross. Figure 5 describes the frequencies, totals and percentages by quadrant.

Value Label	Value	Frequency	Percent
Technically Efficient	1	75	17.9
Low Service	2	76	18.1
High Service	3	62	14.8
Technically Inefficient	4	55	13.1
Four quadrant total		268	
In "Voided Cross" (Eliminated)	5	151	36.0
	Total	419	100.0

Figure 5. Frequency Count by Quadrant

5.00.00 Conclusions

Based on the findings presented here, the following conclusions can be drawn in both a specific and global manner.

In the specifics the following could be deduced. As expected, in the realm of salary expenditures, the High Service districts lead the way with the highest salaries for both teachers and administrators. The rank order of classifications is also consistent with intuitive thought. The second highest group is the Technically Inefficient followed by the Technically Efficient and the Low Service.

Salary schedules of districts are, by and large, based on both years of experience and level of education attained. Districts with high percentages of teachers holding only a bachelors degrees are not required to meet the same relative demands in the payroll area as those having large percentages of teachers with masters plus status. The lowest average number of teachers with bachelor degrees is presented by the High Service districts. Following, in ascending order, are the Technically Efficient, Technically Inefficient, and Low Service. When checking the average number of teachers with a masters plus we see the order of districts reversed. Low Service districts have the lowest percent of Masters + with High Service reporting the highest average numbers.

When we consider pupil ratios to teachers and administrators we see some interesting information. The elementary schools in those districts considered to be Low Service have the highest average pupil-teacher ratio followed by the Technically Efficient. The Technically Inefficient districts report the lowest average ratio. On the secondary level the Technically Efficient unit districts have the highest average pupil-teacher ratio followed by the High Service districts. Low Service and Technically Inefficient districts followed in that order. The average class size in the high schools of the districts considered followed the same order of average values reported.

While one might expect to have the pupil-administrator ratio to follow the pupil-teacher ratio, that was not the case. The rank order of the districts followed that of the quadrants, 1 to 4.

When we take into consideration the ethnic populations of the quadrants the Technically Efficient districts have the higher percentages of minorities with the exception of Asians. Asians, in the Technically Efficient districts account for the second highest percentage. These points not only hold for the student population; they follow the same breakdown when considering the teacher population. Minorities tend to makeup the bulk of the low-income populations. The high concentrations of minorities in the lesser productive districts is, therefore, not surprising.

When considering the average teacher salary, one finds the following types of districts in the salary rangers cited:

o High Salary = $\geq$ \$30039.58	==>	High Service
o \$23351.67 < Med. Salary < \$30039.58	==>	Tech. Efficient High Service
o Low Salary $\leq$ \$23351.67	==>	Low Service

When investigating the average administrator salary, one finds the following pattern of dispersal in the quadrants:

o High Salary $\geq$ \$46581	==>	High Service
o \$36467 < Med. Salary < 46581	==>	Tech. Efficient
o Low Salary $\leq$ \$36467	==>	Low Service

In observing the average number of years of teacher experience, the picture as to the location of districts in quadrants is:

o High Experience $\geq$ 16.89	==>	Tech. Inefficient
o 12.78 < Med. Experience < 16.89	==>	Tech. Efficient
o Low Experience $\leq$ 12.78	==>	Low Service

If one investigates the percentages of teachers with bachelor degrees, the dispersal of districts in quadrants is:

- High # Bachelors $\geq$ 74.77 ==> Low Service
- 49.56 < Med. # Bachelors < 74.77 ==> Tech. Efficient
- Low # Bachelors $\leq$ 49.56 ==> High Service

Consideration of the percentages of teachers with master degrees +, the picture as to the location of districts in quadrants is:

- High # Masters + $\geq$ 50.77 ==> None Reported
- 25.23 < Med. # Masters + < 50.77 ==> Tech. Efficient
- Low # Masters + $\leq$ 25.23 ==> Low Service

In using elementary pupil-teacher ratio, the picture as to the location of districts in quadrant is:

- High Elem P/T Ratio $\geq$ 23.52 ==> Low Service
- 17.48 < Med. Elem P/T Ratio < 23.52 ==> Low Service
- Low Elem P/T Ratio $\leq$ 17.48 ==> Tech. Inefficient

In using secondary pupil-teacher ratio, the picture as to the location of districts in quadrant is:

- High Sec P/T Ratio $\geq$ 23.41 ==> Tech. Inefficient
- 14.79 < Med. Sec P/T Ratio < 23.41 ==> Tech. Efficient
- Low Sec P/T Ratio $\leq$ 14.79 ==> Low Service

In using administrator-pupil ratio, the picture as to the location of districts in quadrant is:

- High P/Admin Ratio $\geq$ 334.33 ==> Tech. Efficient
- 202.83 < Med. P/Admin Ratio < 334.33 ==> Tech. Efficient
- Low P/Admin Ratio $\leq$ 202.83 ==> Low Service

When considering the average district graduation rate, one finds the following types of districts in the graduation rate ranges as follows:

- High Grad Rate $\geq$ 81.7 ==> Low Service
- 63.3 < Med. Grad Rate < 81.7 ==> Tech. Efficient
  High Service
- Low Grad Rate $\leq$ 63.3 ==> Low Service
  Tech. Inefficient

In using the average ACT score to low income ratio, the picture as to the location of districts in quadrants is:

- High ACT Comp $\geq$ 18.51 ==> Tech. Efficient
- 13.87 < Med. ACT Comp < 18.51 ==> Low Service
- Low ACT Comp $\leq$ 13.87 ==> Tech. Inefficient

When considering average high school class size one finds the following types of districts in the class size groupings cited:

- o High Class Size $\geq$ 21.5 ==> High Service
- o 13.5 < Med. Class Size < 21.5 ==> Tech. Efficient
- o Low Class Size $\leq$ 13.5 ==> Tech. Inefficient

When observing the average total number of teachers in the district, the distribution of district types by number range is as follows:

- o High # Teachers $\geq$ 14600.88 ==> Tech. Inefficient
- o 7308.12 < Med. # Teachers < 14600.88 ==> None Reported
- o Low # Teachers $\leq$ 7308.12 ==> Tech. Efficient Low Service

Collectively, the results of the Chi-square analysis might be used to categorically describe a typical school district as found in each of the four quadrants. The following, more global conclusions might be offered concerning the unit districts in Illinois:

Technically-Efficient districts tend to be found in the medium ranges in all except for the pupil-administrator ratio, graduation rate and ACT composite. These three variables cause technically efficient districts to appear in the upper range as well. Only in when considering total number of teachers do we find technically efficient districts in the lower range.

Low-Service districts seem to gravitate to the lower end of the ranges in the areas of teacher salary, administrator salary, teacher experience, secondary pupil teacher ratio, pupil administrator ratio. The upper range contains low service districts when considering number of teachers with a bachelor degree and elementary pupil-teacher ratio. When dealing with the graduation rate there occurs a peculiar situation. Low service districts are found in both the upper and lower ranges the most number of times.

High-Service districts are found to be found in the upper range when considering teacher salary, administrator salary, and high school class size. Graduation rate is the only area where the high service districts are found in the medium range. High concentrations of high service districts occur in the lower range when studying the number of teachers with bachelors and masters degrees.

Technically-Inefficient districts are found in the upper range when taking into account total number of teachers, teacher experience and secondary level pupil-teacher ratio. The technically inefficient districts are absent from the medium

range for all variables considered. The lower range of elementary pupil-teacher ratio, graduation rate and ACT composite is occupied predominantly by technically inefficient districts.

From these specific results the following overall conclusions were drawn.

To begin with, the Technically Efficient unit districts can be found in the medium range in all but three of the variables studied. Location in the lower one-third would be expected when speaking of the total number of teachers in a district. No districts were reported in the medium range.

The second "expected" high category was the high ACT Composite. If they are Technically Efficient, they should be found there.

The Elementary pupil-teacher ratio variable, while not really surprising, was the third variable where Technically Efficient Unit Districts were not the leading number in the medium range. When considering this variable the Low Service districts were the most frequently found followed by the Efficient ones. The counts were very close.

In the realm of politics, societies have encountered a number of ebbs and flows in the operations and philosophies of governments. At times, the fluctuations which occur are likened to the swinging of a pendulum. We speak of governmental ideas swinging toward the conservative right or to the liberal left. Eventually a peak is reached and the motion reverses itself until another maximum is reached. When there is a wide variation in the movement the organization is thought to be unstable. Conversely a limited amount of movement would tend to indicate a more stable configuration. It seems that this is also the case when speaking of unit school districts. Moderation seems to be the watch-word. When situations get too far afield to the upper or lower end it seems as if we drift away from the idea of being Technically Efficient. Whether these are causes or symptoms of the classification is still to be determined.

6.00.00 Limitations on the Procedure

There are many limitations on this procedure. So many, in fact, that not much progress was made to the limitation which were outlined for the other procedures concerning economic efficiency that have been previously discussed. First, The whole analysis rests on state-wide standardized test scores. That is true of most of the other procedures used in economic efficiency studies, as well. It can surely be correctly charged that standardized test scores do not, and can never, capture the full output of the schools; therefore, the test of economic efficiency

is, ipso facto partial, at best. If there is no acceptable measure of output available, there can never be a way to ascertain economic efficiency; however, that cannot be an acceptable answer to taxpayers or to their representative in state legislatures around the country. Second, a known fact is that there has been considerable "creative management" of which students take these standardized tests and which students do not take these tests from year-to-year in school districts. Keeping away some of the low-scoring students on the test day would tend to raise the results over time and to provide a fair amount of error variance in the residuals upon which this analysis is based, as well. There is not much that can be done about this except to plead for greater policing of the manner in which the tests are administered at the local level. It might be possible to increase the standard error of estimate, and to require the district to be in the quadrant for more years; that might adjust for test administration differences around the state.

Economically-efficient schools may not turn-out to be professionally effective schools. It is a major, ethical dilemma for the professional educator, but it is surely not foreign to anyone who serves in the public sector. One can almost hear the hospital administrators saying. "Welcome to the club, old boys. What took you so long?"

7.00.00 Further Research

Having established a viable procedure for identifying Technically Efficient school districts, school finance research now has the capability to compare the districts in each of the four quadrants of the quadriform created. Any quantitative variable, interval or discrete, that is a characteristic of a public school district can be investigated in terms of the quadriform.

Specifically, the next undertaking will be an attempt at investigating the unit school districts in the state of Illinois in terms of the curriculum offered. Of particular interest will be the differences in the breath and depth of the curriculum offered in the districts. The quadriform will, once again, be the basis for categorizing the districts before any examination of the curriculum is attempted.

8.00.00 Suggested Readings

Books

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Variable Descriptives (All as averages)			
Variable	Overall Means	Maximum	Minimum
% Dist Asian Students	.49	9.57	.00
% Dist Black Students	3.42	100.00	.00
% Dist Caucasian Stud.	94.93	100.00	.00
% Dist Hispanic Student	1.12	43.73	.00
% Dist N. American	.04	.73	.00
ACT Composite Score	18.78	22.00	9.02
Avg Admin Salary	38897.35	56609.50	26985.50
Avg Teacher Salary	23087.84	36427.50	16830.00
Total Number Teachers	149.87	21893.67	15.33
Avg Years Teacher Exper	14.26	21.00	8.40
% Bachelor Degrees	69.01	100.00	24.50
% Masters + Degrees	30.89	75.50	.00
% Asian Teachers	.06	2.70	.00
% Black Teachers	1.50	93.13	.00
% Caucasian Teachers	98.21	100.50	6.87
% Hispanic Teachers	.22	8.40	.00
% N. American Teachers	.01	1.77	.00
% Female Teachers	68.74	88.50	48.70
% Male Teachers	31.26	51.30	11.50
Elementary P-T Ratio	19.74	28.97	10.67
Secondary P-T Ratio	15.00	30.97	6.22
Pupil-Admin Ratio	223.73	395.50	91.63
High School Class Size	16.53	25.05	6.62
H. S. Graduation Rate	88.06	101.10	53.02
Total Enrollment	2722.14	416298.3	183.25

9.02.00

Variable Means by Quadrant					
Variable	Tech. Efficient QUAD=1	Low Service QUAD=2	High Service QUAD=3	Tech. Ineffic. QUAD=4	Overall Means
% Dist Asian	.53	.25	1.09	.36	.49
% Dist Black	1.96	2.56	6.65	9.02	3.42
% Dist Caucasian	96.43	96.17	91.08	89.59	94.93
% Dist Hispanic	1.05	1.02	1.12	1.00	1.12
% Dist N. American	.02	.03	.05	.03	.04
Avg ACT Composite	19.77	17.82	19.81	17.38	18.78
Avg Admin Salary	38777.21	37602.84	40583.27	38885.00	38897.35
Avg Teacher Salary	23026.53	21836.37	24885.69	23216.42	23087.84
Total No. Teachers	93.77	57.23	176.86	481.48	149.87
Avg Teacher Exper	14.35	13.84	14.58	14.16	14.26
% Bachelor Degree	67.85	72.78	64.07	69.35	69.01
% Masters + Degree	32.11	27.17	35.86	30.48	30.89
% Asian Teachers	.06	.05	.07	.06	.06
% Black Teachers	.46	1.56	2.44	4.06	1.50
% Caucasian Teacher	99.29	98.18	97.15	94.81	98.21
% Hispanic Teachers	.18	.21	.33	.27	.22
% N. American Teach	.02	.00	.01	.00	.01
% Female Teachers	68.80	69.36	68.66	69.58	68.74
% Male Teachers	31.20	30.64	31.34	30.42	31.26
Elementary P-T Ratio	20.05	20.18	19.47	19.03	19.74
Secondary P-T Ratio	16.05	14.72	15.32	13.79	15.00
P-Admin Ratio	244.10	223.50	219.86	192.76	223.73
Avg Class Size H.S.	17.50	16.47	16.99	15.72	16.52
H.S. Graduation Rate	88.47	87.98	87.37	87.03	88.06

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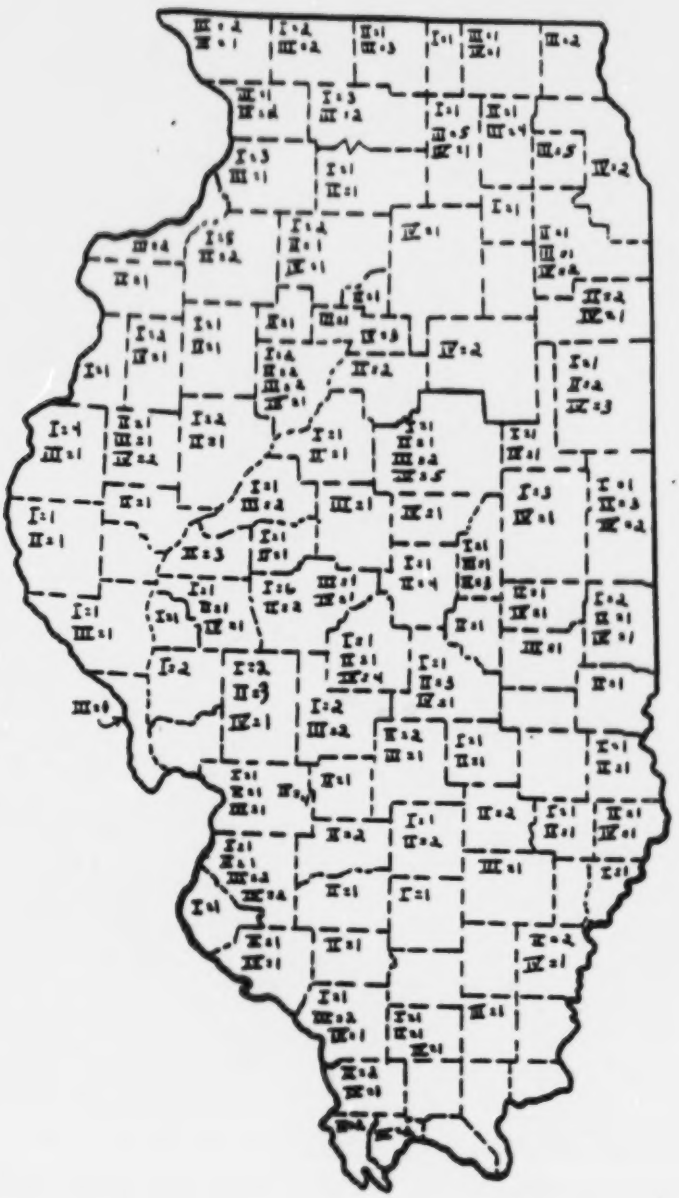
ANOVA Table of Variables		
Variable Title	F-Ratio	F-Prob
% Dist Asian Students	8.3442	.0000
% Dist Black Students	3.6967	.0124
% Dist Caucasian Students	3.3817	.0188
% Dist Native American	3.2300	.0230
Avg % Bachelor Degree	4.6960	.0033
Avg % Masters + Degree	4.6948	.0033
Elementary P-T Ratio	3.0426	.0294
Secondary P-T Ratio	4.0066	.0082
P-Administrator Ratio	10.7043	.0000
Average Teacher Salary	9.7715	.0000
Average Administrator Salary	5.4843	.0011
Avg % Caucasian Teachers *	2.3642	.0715
Avg % Black Teachers *	2.3362	.0742
Average High School Class Size	3.0790	.0280

* Significant with LSD follow-up test

Follow-up Tests (Difference Between Quadrants)			
Variable	**Scheffe**	**Tukey-HSD**	**LSD**
Avg % Asian Students	3 & 2,4,1	3 & 2,4,1	3 & 2,4,1
Avg % Black Students	4 & 1	4 & 1,2	4 & 1,2
Avg % Caucasian Students			2 & 4 1 & 4,3
Avg % Native American	3 & 1	3 & 1	3 & 1,2
ACT Composite Score	1 & 4,2 3 & 4,2	3 & 4,2 1 & 4,2	2 & 4 1 & 4,2 3 & 4,2
Avg Administrator Salary	3 & 2	3 & 2	3 & 2,1,4
Avg Teacher Salary	3 & 2,1	3 & 2,1,4	1 & 2 4 & 2 3 & 2,1,4
Avg % Bachelor Degree	2 & 3	2 & 3	4 & 3 2 & 3,1
Avg % Masters + Degree	3 & 2	3 & 2	1 & 2 3 & 2,4
Avg % Black Teachers			4 & 1
Avg % Caucasian Teachers			1 & 4
Elementary P-T Ratio		2 & 4	3 & 4 2 & 4
Secondary P-T Ratio	1 & 4	1 & 4	3 & 4 1 & 4,2
P-Administrator Ratio	3 & 4 2 & 4 1 & 4	3 & 4 2 & 4 1 & 4,3,2	3 & 4 2 & 4 1 & 4,3,2
High School Class Size	1 & 4	1 & 4	1 & 4 3 & 4

.9.05.00 Quadrants by Illinois County



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